CLAIMS

WE CLAIM:

1. A isolated polypeptide selected from the group consisting of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing fragments, and a fusion protein comprising any of the foregoing.

2. The isolated polypeptide of claim 1 wherein the polypeptide is a soluble polypeptide.

3. The isolated polypeptide of claim 1, wherein the PA-binding fragment of SEQ ID NO:2 begins at any amino acid in the range from 27 to 43 and ends at any amino acid in the range from 221 to 321.

4. The isolated polypeptide of claim 1 having an amino acid sequence set forth in SEQ ID NO:2.

5. An isolated polynucleotide or complement thereof, the polynucleotide encoding a polypeptide selected from the group consisting of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing fragments, and a fusion protein comprising any of the foregoing, the polynucleotide being unable to encode SEQ ID NO:6, SEQ ID NO:8 or SEQ ID NO:10.

6. The isolated polynucleotide of claim 5, wherein the PA-binding fragment of SEQ ID NO:2 begins at any amino acid in the range from 27 to 43 and ends at any amino acid in the range from 221 to 321.

7. The isolated polynucleotide of claim 5 comprising SEQ ID NO:1 from position 104 to 1207 or the complement thereof.

8. The isolated polynucleotide of claim 5 comprising SEQ ID NO:1 or the complement thereof.

9. The isolated polynucleotide of claim 5, wherein the polynucleotide encodes a soluble polypeptide.

10. An isolated polynucleotide or complement thereof, the polynucleotide hybridizing under stringent or moderately stringent hybridization conditions to all or a portion of SEQ ID NO:1 and encoding a soluble, PA-binding polypeptide.

11. A vector comprising a polynucleotide selected from the group consisting of a polynucleotide of claim 5 and a polynucleotide of claim 10.

12. The vector of claim 11, further comprising a non-native expression control sequence operably linked to the polynucleotide.

13. A host cell comprising a vector of claim 11.

14. A method for making an antibody, the method comprising the step of: administering to a non-human animal an immunogenic, PA-binding fragment of a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a polypeptide

at least 80% identical to any of the foregoing and a fusion protein comprising any of the foregoing.

15. A method for identifying an agent that inhibits binding between protective antigen (PA) and anthrax toxin receptor, the method comprising the steps of:

combining protective antigen (PA) and a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, and a fusion protein comprising any of the foregoing, separately with and without a putative binding-inhibiting agent;

comparing binding between PA and the polypeptide with and without the putative agent; and

identifying a decrease in binding with the putative agent, the decrease being an indication that the test agent inhibits the binding of PA to the anthrax toxin receptor.

16. A method for treating anthrax in a human or non-human animal, the method comprising the step of:

administering to the animal an agent that inhibits binding between protective antigen (PA) and anthrax toxin receptor at a level effective to reduce the severity of anthrax.

17. A method as claimed in claim 16, wherein the agent that inhibits binding between PA and the anthrax toxin receptor is selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, a fusion protein comprising any of the foregoing, a monoclonal antibody, a polyclonal antibody, a polysaccharide, a lipid, and a nucleic acid.

18. A cultured cell having a cell membrane having an exterior surface, the exterior surface displaying no receptor for anthrax toxin protective antigen.

19. A method for producing an anthrax toxin receptor, the method including the step of:

transcribing a polynucleotide that encodes an anthrax toxin receptor operably linked to an upstream expression control sequence, the receptor being selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, and a fusion protein comprising any of the foregoing, to produce an mRNA; and

translating the mRNA to produce the anthrax toxin receptor.

20. A method as claimed in Claim 19, wherein the polynucleotide is operably linked to the expression control sequence in an expression vector, and wherein the expression vector is delivered into a host cell, the expression control sequence being operable in the host cell.

21. A method as claimed in Claim 19, wherein at least one of the transcribing and translating steps are performed *in vitro*.